

Physical Specifications

Dimensions

Height	1420mm
Width	770mm
Depth (without YOKE)	760mm
Weight (basic unit)	135kg

Top Shelf

Weight limit	25kg
Width	650mm
Depth	380mm

Work surface

Height	850mm
Width	440mm
Depth	300mm
Material	stainless steel

Flip-up side tray

Height	850mm
Weight limit	12kg
Width	265mm
Depth	330mm

Drawers (internal dimensions)

Quantity	3
Height	120mm
Width	355mm
Depth	340mm

Casters

Diameter	125mm
Brakes	Central control brake

Cylinder YOKE(optional)

Interface	Pin Index Safety System (PISS)
Type	E
Number	Optional 2 cylinders Maximum 4 cylinders

Ventilator Operating Specifications

Modes of ventilation – standard

Manual; IPPV PCV
STANDBY; Demo

Modes of ventilation – Options

SIMV-VC, SIMV-PC
PCV-VG, SIMV-VG
PS/CPAP
BIVENT, APRV

Ventilator parameter ranges

Tidal volume range	20 to 1500 mL Optional 10 to 1500 mL (Volume Control and SIMV modes) 5 to 1500 mL (Pressure Control Vent Mode)
Tidal volume Incremental settings	increments of 5mL(Set Vt below 100mL) or 10mL(when set Vt between 100 and 1000mL) or 50mL(when set Vt bigger than 1000mL)
Pressure (P _{MAX}) range	10 to 100 cmH ₂ O (increments of 1 cmH ₂ O) (IPPV, SIMV-VC and PCV-VG vent modes)
Pressure (P _{support}) range	3 to 60 cmH ₂ O (increments of 1 cmH ₂ O) (SIMV-VC/PC/VG,

	PS/CPAP, BIVENT and APRV vent modes)	Pressure trigger (P_{SENS})	-20 to -1 cmH ₂ O (increments of 1 cmH ₂ O) (SIMV-VC/PC/VG, PS/CPAP, BIVENT and APRV vent modes)
Pressure (P_{TARGET}) range	5 to 70 cmH ₂ O (increments of 1 cmH ₂ O) (PCV and SIMV-PC vent modes)	E_{SENS}	5 to 70% (increments of 5%) (SIMV-VC/PC/VG, PS/CPAP, BIVENT and APRV vent modes)
Freq.	2 to 100 breaths per minute (SIMV-VC, SIMV-PC and SIMV-VG vent modes) 2 to 60 breaths per minute for Freq _{MIN} in PS/CPAP vent modes. 4 to 100 breaths per minute (Other mode) (increments of 1 breath per minute)	I_{SENS}	5 to 70% (increments of 5%) (APRV vent modes)
		P_{HIGH}	5 to 70 cmH ₂ O (increments of 1 cmH ₂ O) (BIVENT and APRV vent modes)
Inspiratory/expiratory ratio	4:1 to 1:8 (increments of 0.5) (IPPV, PCV and PCV-VG vent modes)	P_{LOW}	3 to 50 cmH ₂ O (increments of 1 cmH ₂ O) (BIVENT and APRV vent modes)
Inspiratory time	0.2 to 5 seconds (increments of 0.1 seconds) (SIMV-VC/PC/VG vent modes)	T_{HIGH}	0.2s to 30s (increments of 0.1s) (BIVENT and APRV vent modes)
Inspiratory Pause Time	OFF, 5% to 60% (increments of 5%) (IPPV and SIMV-VC vent modes)	T_{LOW}	0.2s to 30s (increments of 0.1s) (BIVENT and APRV vent modes)
Flow trigger (V_{SENS})	0.5 L/min to 15L/min (increments of 1L/min) (SIMV-VC/PC/VG, PS/CPAP, BIVENT and APRV vent modes)	T_{SLOPE} (Inspiratory Slope Time)	0.2s to 2.0 seconds (increments of 0.1 seconds)

Page 3 of 11

Trend chart Continuous trend information are stored and shown in the chart, including Pressure, CO ₂ , Agent, MV, VT, O ₂ . The machine shall remember the 72 hours trend chart	Inspired oxygen (FiO ₂)	Low: 18 to 99% High: 21 to 100%
	exhalant CO ₂ (etCO ₂)	Low: OFF, 0.1 to 9.8% or OFF, 1 to 74 mmHg High: 0.1 to 9.9% or 1 to 75mmHg
Stories alarms All the alarm messages can be viewed from the log menu. Click on the alarm message bar the detail information of the corresponding alarm appears on the screen. The machine shall remember the lastest 500 alarm messages,	Inspired CO ₂ (FiCO ₂)	High: 0.1 to 1.4% or 1 to 10 mmHg
Delivery/monitoring accuracy Volume delivery < 100 mL = better than 10 mL > 100 mL = better than 15%	Insp. HAL	Low: OFF, 0.1 to 8.3% High: 0.1 to 8.4%
	Insp. ISO	Low: OFF, 0.1 to 8.3% High: 0.1 to 8.4%
Pressure delivery ± 10% or ± 3 cm H ₂ O	Insp. ENF	Low: OFF, 0.1 to 9.8% High: 0.1 to 9.9%
PEEP delivery ± 2cmH ₂ O or ± 15%	Insp. DES	Low: OFF, 0.1 to 21.8% High: 0.1 to 21.9%
Volume monitoring < 100 mL = better than 10 mL > 100 mL = better than 15%	Insp. SEV	Low: OFF, 0.1 to 9.8% High: 0.1 to 9.9%
Pressure monitoring ± 5%	Apnea alarm	Mechanical ventilation ON: Vt < 10 mL breath or P _{mean} < 1 cm H ₂ O or P _{mean} = 1 cm H ₂ O and PEEP ≤ 0 cmH ₂ O measured in 30 seconds when Frequency ≥ 6 Vt < 10 mL breath or P _{mean} < 1 cm H ₂ O or P _{mean} = 1 cm H ₂ O and PEEP ≤ 0 cmH ₂ O measured in 35 seconds when
Alarm settings		
Minute volume (Mvexp)	Low: 0 to 20 L/min High: 1 to 25 L/min	
Low airway pressure	0 to 70 cmH ₂ O	
High pressure	10 to 110 cmH ₂ O	
High Breath Rate	8 to 60 bpm	

	Frequency<6		
	Manual mode:		
	Vt< 10 mL measured in 60 seconds	Ventilator Screen	
		Display type	Color active matrix TFT
Sustained airway pressure	Mechanical ventilation ON:		Touch screen
	Paw>PEEP add 10 cm H ₂ O measured over 15 seconds	Display size	15 inches diagonal
	Continuously Mechanical ventilation OFF:	Pixel format	1024×768
	Paw>10 cm H ₂ O measured over 15 seconds Continuously	Color	LVDS 24 bit, 16777216 colors
Subatmospheric pressure	Paw < -2 cm H ₂ O	Display parameters	All setting and alarm parameters(including Vt, Freq., I:E, T _{INSP} , PEEP, Freq _{MIN} , T _P , Trigger, P _{TARGET} , ΔP, T _{SLOPE} , PEAK, MEAN, PLAT, FIO ₂ , DP, SI, VTI, VTE, I:E, Rsys, Csys VO2, CO2-T
Alarm silence countdown timer:	120 to 0 seconds		

Ventilator components

Flow transducer

Type	Mass type Measure mass flow in bypass application	Display graphics	Wave of P-T, F-T, V-T, CO2-T(option), Paw-V Loop, V-Flow Loop, Paw -Flow Loop
Location	Installed in breathing system	Communication ports	RS-232C compatible serial interface(DB 9 connector); RJ45 connector 100-Base-TX support HL7 communication license; USB 2.0 interface

Oxygen Sensor

Type1	Galvanic fuel cell		
Life Cycle	proximately 12 months (Dependent on usage)		
Type2	Paramagnetic oxygen		
Life Cycle	8 years		

Integrated safety functions

In case of electricity and battery failure, manual ventilation, gas delivery and agent delivery are possible.

Positive pressure relief valve opens at $110 \pm 1 \text{ cmH}_2\text{O}$.

Anesthetic agent delivery

Delivery

Vaporizer	VP300
Type	Halothane, Enflurane, Isoflurane, Sevoflurane,
Number of positions	2
Mounting	Selectatec ^R manifold interlocks

Dimensions

Height	23 cm
Width	12 cm
Depth	21 cm
Weight	6.2 kg
Agent capacity	250ml

Accuracy

Flow range	0.2-15L/min
Operation temperature	15-35°C
Accuracy	$\pm 20\%$ of setting or $\pm 5\%$ of the maximum scale

Agent setting range

Sevoflurane: :
OFF , 0.2% , 0.5% ,
1% , 2% , 3% , 4% ,
5% , 6% , 7% , 8% ;
Halothane, Enflurane,
Isoflurane: OFF ,
0.2% , 0.5% , 1% ,
2% , 3% , 4% , 5% ;

Gas monitor(optional)

Type	main stream/side stream
Module	IRMA CO ₂ ; IRMA AX+ ISA CO ₂ ; ISA AX+
Operating temperature	IRMA AX+: 10 to 40 °C (50 to 104 °F) IRMA CO ₂ : 0 to 40 °C (32 to 104 °F) ISA CO ₂ : 0 to 50 °C (32 to 122 °F) ISA AX+: 5 to 50 °C (41 to 122 °F)
Storage temperature	IRMA AX+: -20 to 75 °C (-4 to 167 °F) IRMA CO ₂ : -40 to 75 °C (-40 to 167 °F) ISA CO ₂ : -40 to 70 °C (-40 to 158 °F) ISA AX+: -40 to 70 °C (-40 to 158 °F)
Operating humidity	< 4 kPa H ₂ O (non-

	condensing) (95 %RH at 30 °C)	Infant.	
Operating atmospheric pressure	525 - 1200 hPa (<4572 m)	ISA Nomoline	Sampling line with proprietary water removal tubing. 2 m±0.1m versions
Warm-up time	IRMA AX+/ISA AX+: < 20 sec IRMA CO ₂ /ISA CO ₂ : < 10 sec	Carbon Dioxide (CO₂) Moudle (IRMA/ISA CO₂)	
		Monitor Gas	CO ₂
Rise Time	IRMA CO ₂ / AX+: CO ₂ ≤90ms N ₂ O≤300ms HAL, ISO, ENF, SEV, DES≤300ms ISA CO ₂ : CO ₂ ≤200ms ISA AX+ : CO ₂ ≤300ms N ₂ O, O ₂ , ENF, ISO, SEV, DES ≤400ms HAL ≤500ms	Measurement range	0-15 vol%
		Accuracy	0-15 vol% ± (0.2 vol% + 2 % of reading)
		Anaesthesia Gas Moudle(IRMA/ISA AX+)	
		Monitor Gases	CO ₂ ;N ₂ O;HAL;ISO;EN F;SEV;DES
ISA sampling flow rate	50 ± 10 ml/min	Measurement range	CO ₂ : 0-15 vol% N ₂ O: 0-100 vol% HAL, ISO, ENF: 0-8 vol% SEV: 0-10 vol% DES: 0-22 vol%
Breath detect	Adaptive threshold, minimum 1 % CO ₂ change.		
Respiratory rate:	0 - 150 bpm ± 1 bpm	Accuracy	
		CO ₂	0-15 vol% ± (0.2 vol% + 2 % of reading)
Compensation:	Automatic for atmospheric pressure, temperature and spectral interference		
		N ₂ O	±(2 vol% + 2 % of reading)
Airway adapters			
IRMA Airway Adapter Adult/Paediatric	6 ml dead space	HAL, ISO, ENF	±(0.15 vol% + 5 % of reading)
IRMA Airway Adapter	1 ml dead space		

SEV	$\pm(0.15 \text{ vol\%} + 5 \% \text{ of reading})$	Battery type	Internal rechargeable sealed lead acid 24VDC,5.0AH
DES	$\pm(0.15 \text{ vol\%} + 5 \% \text{ of reading})$	Backup power	Demonstrated battery backup time under typical operating conditions is 120 minutes when fully charged
Paramagnetic oxygen module			
Range	0-100%	Charge time	< 8 hours (in running status or standby mode)
Accuracy	$< \pm 0.2\% \text{ O}_2$	Power code	5m/16.4ft
Response Time (T10 –T90)	8 to 20 seconds dependent on application and filter selection (biological filter on request)	Outlets	4 outlets on back
Operation Temperature	5 °C to 50 °C (41°F to 122°F)	Maximum output valve of auxiliary AC power plug	1.5A(single plug); 6A(in total)
Storage Temperature	-30°C to 70°C (-22°F to 158°F)	Pneumatic specifications	
Storage Pressure	10kPa-200kPa(1.5psi-30psi)		
Ambient Humidity	0 to 95% non-condensing		
RoHS	ROHS Directive 2002/95/EC	Auxiliary common gas outlet(optional) Connector:	ISO 22 mm OD and 15 mm ID
		Security	Anti-misconnection switch and prominent prompts on the screen

Electrical specifications

Power and battery backup

Power input	100-240V,50/60Hz, Max. $\leq 8\text{A}$
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Gas supply

Gas type	O ₂ ,N ₂ O,Air
Pipeline input range	280 kPa to 600 kPa/41 psi to 87 psi
Pipeline connections	NIST/DISS

Cylinder input Pin-index yokes

Primary regulator 250 kPa/36psig
nominal output

O₂ controls

Method Proportionate
decrease of N₂O with
reduction in O₂
pressure

Supply failure alarm Range: 185 to 215
kPa

O₂ flush Range: 25 to 75 L/min

Electronic control Flowmeter (Electronic Mixer)

O₂ ranges 0 to 10 L/min

N₂O ranges 0 to 10 L/min

Air ranges 0 to 12 L/min

Total Flow Control Total flow range: 0.2
Mode to 18 L/min
O concentration
range: 21% to 100%

Integrated safety functions

Guarantees a minimum O₂ concentration of 25%
in an O₂/N₂O mixture.

N₂O cut-off if O₂ pressure is less than 200kPa

Driven gas auto-switch(optional)

Use compressed air as the driving gas.

When the compressed air supply is disrupted,
the machine will automatically switch to O₂
driving gas.

Auxiliary oxygen inhalation

Range 1-15L/min

Pressure 400kPa

Flow indicator Flow tube

Auxiliary gas output

Gas Oxygen

Pressure 280-600kPa

Flow rate Max.90L/min

Breathing circuit specifications

Carbon dioxide absorbent canister

Absorbent capacity 1500ml

CO₂ bypass Optional

Ports and connectors

Exhalation 22 mm OD ISO 15
mm ID taper

Inhalation 22 mm OD ISO 15
mm ID taper

Bag port 22 mm OD

Pressure gauge

Scale range -20 to 100 cm H₂O

Bag-to-Ventilator switch

Type Key switch

Control Controls ventilator and
direction of
breathing gas within
the circuit

Integrated Adjustable Pressure Limiting (APL) valve

Range	0 to 70 cm H ₂ O
Tactile knob indication at	30 cm H ₂ O and above
Adjustment range of rotation	0 to 30 cm H ₂ O (0 to 180°) 30 to 70 cm H ₂ O (180 to 288°)
Accuracy	< 30 cm H ₂ O: ±3 cm H ₂ O; ≥30 cm H ₂ O: ±15% of set value;

Breathing circuit parameters

Compliance (Bag mode)	4.5ml/ cm H ₂ O
Compliance (Mechanical Mode)	Automatically compensates for compression losses within the absorber and bellows assembly
Circuit volume	3.9 L Vent Mode (including absorber; bellow) 2.4 L Bag Mode

Expiratory resistance under manual condition	0.51 kPa
Inpiratory resistance under manual condition	0.39 kPa

Expiratory resistance under automatic	0.57 kPa
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Inpiratory resistance under automatic	0.22 kPa
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Note: According to ISO 80601-2-13, test under peak flow 60L/min, fresh gas 10L/min.

Heating system(optional)

Temperature	32 - 40°C
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Materials

All materials in contact with exhaled patient gases are autoclavable, except mechanical pressure meter and O₂ cell.

All materials in contact with patient gas are free of natural rubber latex.

Anesthetic gas scavenging System(AGSS)

Size	445×142×95 (height x width x depth)
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Weight	2.25Kg
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Type of disposal system	Low-flow disposal system
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extract Flow	35L/Min~50L/Min
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Pressure relief device	Pressure compensation opening to the atmosphere
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Filter	Stainless screen with hole diameter of
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150µm

Spillage <100mL/min

Maximum constant flow 50L/Min

Maximum intermittent flow 35L/Min

Environmental specifications

System operation

Temperature 10 to 40°C

Humidity Less than 95% relative humidity, non-condensing.

Atmospheric pressure 70-106kPa

System storage

Temperature - 20 to 55°C

Humidity Less than 95% relative humidity, non-condensing.

Barometric 70-106kPa

Electromagnetic compatibility

Immunity Complies with all requirements of EN 60601-1-2

Emissions CISPR 11 group 1 class A



CE mark in this manual apply only to product with CE mark.

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